

REMARKS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 26-36 are presently active in this case, Claims 26-36 having been added by way of the present Amendment, and Claims 1-25 being canceled without prejudice or disclaimer.

The Applicants wish to thank Examiner Kirsten Jolly for the courtesies extended to Applicants' representative, Christopher Ward, during the personal interview conducted on July 11, 2003. During the interview, new Claims 26-36 set forth herein were discussed in view of the Hasebe et al. reference (U.S. Patent No. 5,658,615). During the interview, Examiner Jolly agreed that the new Claims 26-36 appeared to be allowable, subject to further review and an updated search.

In the outstanding Official Action, the disclosure was objected to for a minor informality. Accordingly, the specification has been amended to include a paragraph stating that the present application is a divisional of U.S. Application Ser. No. 09/312,542, which is now U.S. Patent No. 6,281,145. The Applicants therefore request the withdrawal of the objection to the disclosure.

Claims 15, 16, and 25 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 15, 16, and 25 have been canceled thereby rendering this rejection moot. The new claims properly recite to either an apparatus or a method, as appropriate. Accordingly, the Applicants request the withdrawal of the indefiniteness rejections.

Claims 14-17 and 20-23 were rejected under 35 U.S.C. 102(b) as being anticipated by, or, in the alternative, under 35 U.S.C. 103(a) as unpatentable over Hasebe et al. (U.S. Patent No. 5,658,615). Claims 18 and 24 were rejected under 35 U.S.C. 103(a) as being unpatentable over Hasebe et al. Claims 19 and 25 were rejected under 35 U.S.C. 103(a) as being unpatentable over Hasebe et al. in view of Akimoto et al. (U.S. Patent No. 5,938,847). For the reasons discussed below, the Applicants request the withdrawal of the obviousness rejections.

Claims 14-25 have been canceled, thereby rendering the above art rejections moot.

Newly added independent Claims 26 and 32 are considered allowable as they recite features of the invention that are neither disclosed nor suggested by the references of record.

As discussed during the personal interview, Claim advantageously recites a process solution applying method for selectively supplying different types of process solutions to a substrate in a small total supply amount, and forming a process solution film having a uniform thickness, where the method comprises, among other features, a control section which selects a supply system corresponding to the selected process solution, and drives the supply mechanism of the selected supply system *at a supply rate prescribed for the selected process solution*, wherein the supply rate of each of the process solutions is prescribed to be such a value that the corresponding process solution applied in a predetermined total supply amount, while the substrate is rotated at a predetermined rotational speed, forms a process solution film having a uniform thickness on an entire surface of the substrate. Additionally, Claim 32 advantageously recites a resist solution applying method for selectively supplying different types of resist solutions to a substrate in a small total supply amount, and forming a resist solution film having a uniform thickness, where the method comprises a control section

which selects a supply system corresponding to the selected resist solution, and drives the supply mechanism of the selected supply system *at a supply rate prescribed for the selected resist solution*, wherein the supply rate of each of the resist solutions is prescribed to be such a value that the corresponding resist solution applied in a predetermined total supply amount, while the substrate is rotated at a predetermined rotational speed, forms a resist solution film having a uniform thickness on an entire surface of the substrate.

Independent Claims 26 and 32 clarify the method in which different types of process solutions or resist solutions are selectively supplied to a substrate in a small total supply amount, and in which a process solution film or resist solution film is formed having a uniform thickness. Particularly, clarified is the relationship of the supply rates of the process solutions or resist solutions stored in the controller, relative to the rotational speed of the spin holder and the total supply amounts of the process solutions or resist solutions.

The present invention resides in the arrangement for selectively supplying different types of process solutions or resist solutions to a substrate in a small total supply amount, and forming a process solution film or resist solution film having a uniform thickness. For example, according to the conventional technique, a large total supply amount of 10 ml (for a 6in-wafer) of a resist solution is used for each substrate. Supplying a large amount of resist solution on a wafer makes it easier to form a resist solution film having a uniform thickness. However, of the 10 ml, 8ml or more of the resist solution is scattered therearound by revolution of the spin holder, and thus wasted.

By contrast, a very small total supply amount of a resist solution, such as 2 ml or less (for a 6in-wafer), as recited in Claims 22 and 37, can be used for each substrate in the present invention. In this case, it is difficult to form a resist solution film having a uniform thickness.

There are several parameters for adjusting the planer uniformity, and some of them bring about a trade-off relationship to it with other characteristics. The present inventors studied this technical field, and have found that the arrangement as recited in Claims 26 and 32 is preferable. Figures 1 and 2 of the present application clearly depict, what could be considered, unexpected results achieved by the inventors using the present invention. Specifically, the present invention uses a database constructed for this solution applying method, in which the supply rate of each of the process solutions is prescribed to be such a value that the corresponding process solution applied in a predetermined total supply amount, while the substrate is rotated at a predetermined rotational speed, forms a process solution film having a uniform thickness on an entire surface of the substrate. With this arrangement, it is possible to select and adjust a supply system corresponding to a process solution selected from the process solutions, so as to reliably control the necessary total supply amount and uniform film thickness of the process solution.

On the other hand, Hasebe et al. discloses a relationship between the rotational speed of a substrate and the amount of process solution applied thereto. (See, e.g. Claim 2 of the Hasebe et al. reference.) The Hasebe et al. reference also describes that while one process solution is supplied, the supply rate of a process solution is changed in accordance with the change in rotational speed of a spin holder. However, this reference does not pay any attention to an arrangement for selectively supplying different types of process solutions in a small total supply amount, and forming a process solution film having a uniform thickness. As a consequence, this reference has no suggestion about the constructed database according to the present invention.

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The Applicants respectfully submit that Claims 26 and 32 are allowable over the art cited in the Official Action.

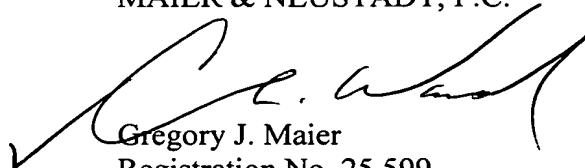
Claims 27-31 are considered allowable for the reasons advanced for Claim 26 from which they depend. These claims are further considered allowable as they recite other features of the invention that are neither disclosed, taught, nor suggested by the applied references when those features are considered within the context of Claim 26.

Claims 33-36 are considered allowable for the reasons advanced for Claim 32 from which they depend. These claims are further considered allowable as they recite other features of the invention that are neither disclosed, taught, nor suggested by the applied references when those features are considered within the context of Claim 32.

Consequently, in view of the above discussion, it is respectfully submitted that the present application is in condition for formal allowance and an early and favorable reconsideration of this application is therefore requested.

Respectfully Submitted,

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